

Appln No. 09/960,536

Amdt date March 15, 2005

Reply to Office action of December 20, 2004

Amendments to the Drawings:

The attached 5 sheets of drawings includes changes to Figure 2 and Figure 7. These 5 replacement sheets, which includes Figs. 2 and 7, replace the original drawings as filed.

Attachment: Replacement Sheet

Annotated Sheet Showing Changes

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REMARKS/ARGUMENTS

Claims 1-20 are pending. Claims 1, 2, 9-12 and 14 are amended.

Drawings are objected to because of minor informalities. In view of the amendments to FIGs. 2 and 7, it is respectfully requested that the above objections be withdrawn.

The specification (including the Abstract) are objected to because of informalities. In view of the amendments to the specification (including the Abstract), it is respectfully requested that the above objections be withdrawn.

Claims 2, 9, and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In view of the amendments to claims 2, 9, and 14, it is respectfully requested that the above rejections be withdrawn.

Claims 10 and 11 are amended to better define the variable of equation (1). Claim 12 is amended to correct a typographical error.

Claims 3, 4, 6, 10-12, 15-16, and 18 are allowable if rewritten in independent form.

Claims 9 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Mohindra Rishi (U.S. 6,127,884). Claims 1, 2, 5, 7, 8, 14, 17, 19, and 20 are rejected under 35 U.S.C. 102(e) [in a telephone conference, the Examiner clarifies that the rejection is under 35 U.S.C. 102(e) and not 35 U.S.C. 102(b), as mistakenly indicated in the Office action] as being anticipated by Ahmadreza Rofougaran (U.S. 6,738,601).

Amended independent claim 1, includes, among other limitations, "an IF demodulator for receiving the I signal and

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the Q signal without down conversion to a baseband signal." Rofougaran (601) does not disclose the above limitation.

Rather, Rofougaran (601) discloses a receiver 10 for receiving a signal. The receiver 10 includes a low noise amplifier 22. The output of the LNA 22 is downconverted to a low IF frequency by the combination of complex IF mixers 24 and a complex bandpass filter 26. The output of the complex bandpass filter 26 is coupled to a programmable multiple gain stage amplifier 28. -(See, FIGs. 1 and 2, and col 8, lines 9-23).

However, the "output of the amplifier 28 is coupled to a second set of complex IF mixers 30 where it is mixed with the IF clocks from the LO generator for the purpose of downconverting the complex IF signal to baseband." (Col. 8, lines 34-37, underlining added.). Accordingly, Rofougaran (601) does not disclose "an IF demodulator for receiving the I signal and the Q signal without down conversion to a baseband signal," as recited by the amended independent claim 1 and thus claim 1 is not anticipated by Rofougaran (601).

Amended independent claim 14, includes, among other limitations, "a first IF differentiator for differentiating an I signal without down conversion to a baseband signal," and "a second IF differentiator for differentiating a Q signal without down conversion to a baseband signal."

For similar reasons discussed above, Rofougaran (601) does not disclose the above limitations and thus claim 14 is not anticipated by Rofougaran (601) either.

Amended independent claim 9, includes, among other limitations, "receiving modulated signal," "generating an IF I

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signal and an IF Q signal from the received modulated signal without converting the received modulated signal to a baseband signal," "differentiating the I signal at the frequency of the I signal by a first IF differentiator," and "differentiating the Q signal at the frequency of the Q signal by a second IF differentiator." Rishi does not disclose the above limitations.

Rather, Rishi describes a system including a receiver and a quadrature-demodulator for receiving and demodulating a quadrature-modulated signal. The receiver 3 includes an amplifier 30 which is coupled to the quadrature demodulator 31. (See, FIG. 1). The quadrature demodulator 31 includes a mixer 36 that "produces an in-phase signal I', and the mixer 36 produces a quadrature signal Q', the in-phase and quadrature signals I' and Q' being down-converted base band versions of the quadrature modulated signal s(t), either at zero-IF or at low-IF." (Col. 4, lines 27-32, and FIG. 1, underlining added.). The receiver 3 "further comprises a succession of a low pass filter 50, a variable gain amplifier 51, and a low pass filter 52 . . . a succession of a low pass filter 53, a variable gain amplifier 54, and a low pass filter 55." (Col. 4, lines 32-37.).

The (down-converted base band versions of the) outputs of the low pass filters 52 and 55 are then fed to integrators 73 and 74. Consequently, the system of Rishi does not generate "an IF I signal and an IF Q signal from the received modulated signal without converting the received modulated signal to a baseband signal," as recited by amended claim 14.

Furthermore, the differentiators of Rishi do not differentiate

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the I [Q] signal at the frequency of the I [Q] signal, because their input is already down-converted to the base band signal. Finally, the differentiators of Rishi are not IF differentiators, as recited by claim 14. As a result, claim 14 is not anticipated by Rishi.

In short, the independent claims 1, 9 and 14 define a novel and unobvious invention over the cited references. Thus, these claims are allowable over the cited references. The remaining dependent claims 2-8, 10-13 and 15-20 are dependent from the independent claims 1, 9, and 14, respectively and include all the limitations of those claims and additional limitations therein. Accordingly, these claims are also allowable over the cited references, as being dependent from allowable independent claims and for the additional limitations they include therein.

In view of the foregoing remarks, it is respectfully submitted that this application is now in condition for allowance, and accordingly, reconsideration and allowance are respectfully requested.

Respectfully submitted,
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RRT/clv



The diagram illustrates a PLL-based demodulator. It starts with a 2MHz signal source (21) providing I and Q channels. These are mixed with a reference signal $A\sin(\omega_I t + \phi(t) dt)$ (22) and its derivative d/dt at IF (23). The resulting signals are then mixed with the derivative of the reference signal $-A\phi(t)\sin(\omega_I t + \phi(t) dt)$ (24). The outputs are summed (25) and then passed through a slicer (28) to produce digital bits. The slicer also outputs $A\phi(t) + \text{SPURS}$ (27).

